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EXPERT TESTIMONY AS IT RELATES TO OPHTHALMOLOGY.

BY DERRICK T. VAIL, M.D.,
CINCINNATI.

Mr. President and Fellow Members:

Expert ocular testimony implies, in the first place, an accurate and detailed knowledge of the science of ophthalmology, coupled with abundant practical experience, and in the second place a complete understanding of the plaintiff's ocular condition.

For an expert to diagnose and treat an ophthalmic case in routine practice entails only a moderate amount of time, for much of the tedious work, such as taking the visual fields, testing the ocular muscles, etc., is well done by trained assistants under his supervision; but the examination of a case with a view of furnishing evidence entails the expenditure of a great deal more time on the part of the oculist himself, for the clinical reports furnished by assistants amount to only hearsay evidence and will not be admitted. It is therefore our duty to conduct this examination person-

*Read at the 10th annual meeting of the American Academy of Ophthalmology and Oto-Laryngology, Buffalo, Sept. 14th to 16th.

ally and with consummate care. We may be asked while on the stand to state the details of our examination step by step. This is done in order to find if some detail has been neglected. The hurried and incomplete examination of the plaintiff's eyes is sure to be exposed in glaring exaggeration before the jury to the detriment of the expert.

The habit of examining a case in a cursory manner is apt to lead to a wrong diagnosis, and even an expert of undoubted ability will be led to honestly testify to a false state of affairs. To illustrate: A man brought suit against a railroad company to secure damages for alleged personal injury, the result of an accident which he claimed was due to the company's negligence. He claimed his vision was injured, paralytic ptosis present, and that there were other signs of oncoming blindness. An expert oculist substantiated his claim on the witness stand.

Another oculist, not knowing about this evidence, testified that the impairment of vision was due to a slight pannus, and that the ptosis was entirely inflammatory; both being due to chronic trachoma, which was present and which must have existed many years prior to the accident. The former oculist was led to testify falsely because he had evidently *failed to evert the upper lid* in his examination of the eyes.

We should make it a rule to examine every tissue in its natural turn before going on the stand to testify. The frequency with which malingery exists in the cases of personal damage suits should put us on our guard. An element of exaggeration of symptoms exists in many of the ophthalmic cases which come to us for treatment, but in the personal injury cases it is usually much greater.

There is no class of cases which calls for greater perception and skill in diagnosis than these cases of simulation. In many of the cases of marked exaggeration of symptoms, there exists a real injury, of slight significance perhaps, and it is just to allow the plaintiff the benefit of an admission that the injury exists and an honest statement of what it amounts to.

Excellent works on visual-economics are to be had, wherein we find working formulæ for estimating the amount of pecuniary compensation which is just in nearly every case.

In the cases I have been called on to testify, my opinion regarding pecuniary compensation was not asked. I have thought that the reason was that that was the province of the jury to decide.

I wish now to speak of some of the disagreeable features connected with expert testimony. One is that if you have distinguished yourself on the witness stand as an expert, you are apt to be called to testify in all sorts of ophthalmic cases. This will result in positive injury to your reputation. You stand in danger of being considered a court hanger-on, and are judged ready to serve as an ideal witness on whichever side engages your services first. This is a disagreeable feature, being absolutely unjust.

Another disagreeable feature is that your evidence may run entirely counter to the interests of the side employing your services, and as you must look to the party subpoenaing you for your fee as an expert, you feel diffident about pocketing the man's money after testifying against him. If the court would but order the examination, and pay for it out of the court costs, it would do away with this unpleasant feeling.

Another disagreeable feature that occasionally arises, is that some one of your colleagues has been summoned on the other side and has given testimony the exact opposite of yours. In such a case you may be asked your opinion regarding him and how he stands in the profession. You take pleasure in lauding your confrère, but in so doing depreciate your own testimony and appreciate his. Your duty is to speak well of anyone who is in good standing in the profession, even if your own testimony must suffer. This is sometimes, though rarely, a disagreeable feature.

In giving your testimony you should use language comprehensible to the most illiterate juryman, and your answers to questions should be short, unequivocal, honest and frank. There should be no attempt to display knowledge or skill; the short, plain and polite answer to a question is the best passport to the good opinion of the court and jury. An expert who has made a thorough examination and has learned the exact ocular condition of the plaintiff has nothing to fear from cunning or pugnacious lawyers.

Sometimes an expert is called on to explain or elucidate ophthalmic matters. He does not testify regarding the plaintiff, for he has not examined him, and yet the hypothetical questions which are asked bear directly on the case before the jury. It is best to regard the hypothetical question in a broad sense, for by so doing the answer will be qualified to meet any exigency which may arise in the cross-examination. Occasionally you will be gratified to see that your testimony has given satisfaction to both plaintiff and defendant. In such a case I was once doubly gratified, for I received a fee for expert testimony from each side.

And finally, I would say a word regarding a fourth party which is involved in every case. So far I have referred to but three interested parties, viz.: the Expert, the Court of Justice and the Contestants at Law. There is a fourth—our Great Specialty. Every expert is regarded as an exponent. See to it that you bear yourself in such a way as to incite honor and respect for Ophthalmology.

THE LENS-CAPSULE IN THE OPERATION OF CATARACT.*

By HERMANN KNAPP, M.D.

NEW YORK.

THREE recent publications have determined me to accept your president's invitation to read a paper before the Academy of Ophthalmology and Oto-Laryngology. The first is a remarkable and important discussion on "Capsular Complications After Cataract Extractions," at the Ophthalmic Section of the British Medical Association, August 26, 1905, in the *British Medical Journal*, p. 433. The discussion was introduced by E. Treacher Collins. The Journal has only an abstract of the paper, which deals with the difficulties that are caused through the lens capsule, under two heads:

I, *By entering into the section wound*, where it retards the closure of the wound and induces the most deleterious consequences, first causing an uneven, irritable scar, which draws

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the iris into its proliferating intumescence, develops into kerato-irido-cyclitis, and finally into a chronic sero-plastic uveitis, ending not only in the blindness of the operated eye, but also of the other by sympathetic ophthalmitis;

II, By opacifying in loco.

Mr. Collins grounded his remarks on specimens of three cases of severe irido-cyclitis, of which two had degenerated into sympathetic inflammations of the fellow eye. In all three cases the sections showed thickening of the sclera-corneal tissue in the vicinity of the wound by infiltration with round-cell exudate. The conjunctival flap was elevated, due to the cell infiltration beneath it, and there was a large accumulation of cells surrounding the entire capsule, with some giant cells.

The simple agglutination of the capsule into the wound is frequent and produces only a mild irritation with slight thickening of its site. It may cause glaucoma by drawing the iris forward, and occupying the angle. In almost all cases of combined extraction, adhesions of the iris stump to the scar have been found in the eyes that have been examined under the microscope (O. Becker). These adhesions drag also the adjacent apices of the ciliary processes into the common scar, —a swampy gutter, filled with pabulum for those foulest parasites so eagerly hunted and never caught.

How is this condition to be avoided, if it cannot be cured? It is well known—and the late professor Arlt, one of the best known cataract operators, told me so forty years ago—that sympathetic ophthalmia is much rarer in simple flap operations than in Graefe's method. I can confirm this. When I made the old flap extraction I lost cases by infection, but none that drew the fellow eye into this awful calamity. During my practice in New York I remember two cases of loss by sympathetic irido-choroiditis after Graefe's operation. One has remained vividly in my memory because the most unfortunate consequences followed the operation. At that time I made a miscellaneous division of the centre of the capsule, "scratching," say our fellow eye surgeons on the other side of the ocean. There were little cataract remnants, capsule shreds, and probably also some iris in one small deposit near one of the angles of the section. The old gentleman, gouty and debilitated, suffered a great deal. He was visited daily

by his wife and daughter, who were much distressed. I treated him very carefully. He was a good patient, and was six to eight weeks in the hospital; but when he felt certain that he would remain blind in both eyes, he drowned himself in his bath tub. Since I have adopted the method of opening the capsule peripherically, and parallel to the corneal section, and omitting the iridectomy, I have not seen a trace of sympathetic ophthalmia.

When this peripheral opening is correctly done, I have prolapses of the iris, which I cut as soon as I see them—that is, the day after the night in which they occur. This is mostly in the first night. If a prolapse is cut before any agglutination has taken place, the coloboma is easy and clean. The other methods of opening the capsule do not give so much protection from incarceration.

Allow me to discuss these other modes of opening the capsule. Two years ago Major Herbert, eye surgeon in Bombay, came out with a very useful little book on the technique of extraction of cataract. He criticised my peripheric splitting. He made light of it, saying that this splitting at the upper border of the lens behind the iris, where we cannot see what we do and the lens will escape only with great difficulty, condemns it at once. I reviewed his book and recommended it earnestly and heartily, because it contains many very practical hints and advices, rules which the orthodox text-books ignore. In cataract operation, the least technical trifle that serves a point ever so small should be duly appreciated. In my review of Major Herbert's monograph, with all the just praise, I had to take exception to his manner of opening the capsule, which is by a vertical slit from the lower point of the dilated pupil to the upper. This is the capsule opening I knew long ago. I do not criticise it by deductive argument, but by dry and hard experience. Von Graefe, my teacher, did that splitting during my studies in his hospital. At that time I was not quite a tyro in ophthalmology; among my apprenticeships I could count a year in London at the old Moorefields with Bowman, Critchett, and others, where I seldom missed a day.

The vertical splitting is unfavorable for the exit of the lens; the horizontal, parallel to the corneal section, offers its

easiest escape. The iris is no appreciative hindrance. The next and worst drawback of the vertical splitting is that it produces a more or less dense scar, which is much in the way of the light and which is very unpleasant to divide by a later capsulotomy. Graefe made not only a vertical split in the capsule, but also a horizontal one at the periphery of the coloboma.

He opened the capsule horizontally in the upper part with a cystotome, which he then turned and with it ripped the capsule from below upward to meet the horizontal incision. In this way he obtained a broad, T-shaped opening, which did not always remain large enough, and my imitation of this procedure in Heidelberg and New York proved no more obliging. The peripheric single opening leaves a fine scar near the upper margin of the capsule. The latter is left intact in all the other parts, and is most favorable for a secondary splitting with a sharp, well proportioned knife-needle. The opening crucial or T-shaped, remains almost always permanent. Every now and then some of my patients who have been operated that way fifteen to twenty-five years ago, come to show me their eyes. They are ideal, i. e., no disfigurement at all, clear, black pupil, T and S normal, and the patients say they never have any trouble with their sight.

Let me still consider two other modes of opening the capsule. The older one is to "scratch" the centre of the anterior capsule in different directions with a cystotome, curved needle, or fine hook. This was the general method of Arlt, in Vienna, and many others 40 to 75 years ago, and it is still practiced by many competent operators. Years ago I went through the eye clinic in Vienna, where Prof. Arlt showed me one of his patients. He had often been in my clinic at Heidelberg, and at times he performed some cataract extractions when he was asked by the members of the German Ophthalmic Society at the yearly conventions.

I showed him cases with peripheric capsule opening, and told him that this was a feature of the cataract operation, because it was almost always free from synechiæ. He said he had none either after central and miscellaneous discision. I expressed my doubt. He said, "I shall convince you if you come to Vienna again." It was not long after that I

went to Vienna, and he showed me all the cases operated and asked me to inspect the pupils with oblique light myself. I did so and told him: "There is no free pupil; all have fine adhesions." "Oh, yes," he replied; "those are delicate agglutinations, not inflammatory products. They do not impair the sight, and signify nothing." I soon detected the cause of these innocent agglutinations. In watching the passage of the cataract through the narrow pupillary area, I saw small ruptures at the border of the pupil. They were little angular ruptures, well visible so long as the white lens was their background; as soon as the lens is out they contract and cannot be seen any more. In some eyes there are no adhesions, but many show the small synechie. Their creation, so far as I can explain it, is as follows: When the capsule is ruptured miscellaneously its small shreds come in contact with the tiny, irregular ruptures of the iris and agglutinate. When the capsule is incised away from any rupture of the sphincter portion of the lens, the two wounds do not meet, but close separately. When in a month or later the capsule is discindled with the knife-needle, the shreds of the capsule do not touch a ruptured place, and the pupil remains with very few or no synechie, constituting an ideal pupil.

The next mode of opening the capsule is to tear a central leaflet from the anterior capsule. This mode is very commendable. About five years ago, on a journey from Egypt to Vienna, I stopped in Buda-Pesth and visited the University Eyeclinic, which at the time was in the care of Professor Schuleck. I knew from his publications and hearsay that he was an excellent operator. In the hospital were about a dozen patients operated for cataract. Schuleck showed me all, let me examine them myself, and he operated, by Graefe's combined extraction, two patients before me. The operations were without accident, and the patients previously operated on were in the best way of recovery. This mode of removing cataracts is very commendable.

When the combined extraction had become popular, and I had in Heidelberg a fairly large opportunity of operating cataracts, I saw that the capsule was the most difficult factor in the cataract operation. In one of the periodical statistical

reports of my cataract operations, I said: "The man who invents a safe method of removing the central part of the anterior capsule will be the greatest benefactor of the hosts of countless old blind people." If in the combined operation the capsule is removed, success is almost certain, provided there are no complications on the part of the eye and no coarse technical faults. Yet there are also difficulties in the removal of the central part of the anterior capsule. It is mostly done with a capsule forceps, the teeth of which are sharp and bent somewhat backward. The accidents to which this is open are chiefly the dislocation of the lens with prolapse of the vitreous and its consequences. Hard capsules do not yield, so that the whole cataract comes out with the capsule, which as a rule gives excellent results. Professor Fuchs in Vienna is a great advocate of this method.

Another drawback inherent to this method is the necessity of an excision of a piece of iris; otherwise it is too hazardous to manipulate in the narrow pupillary space. I have devised a peculiar capsule forceps (about twen years ago), according to the principle of the nautical grapple-hook. When the branches of the forceps are opened their claws are directed obliquely towards the capsule, and when the forceps closes it grasps the central part of the iris and removes it, when it is withdrawn. I have not used this forceps so much as I might have. The reason was that the tearing of this piece of capsule may dislocate the lens, and leads to prolapse of vitreous when the lens is expelled. Apart from that it produces not a permanent clear way for the passage of the rays of light, as the posterior capsule will opacify, too, by wrinkling and dotting, so that patients who had very good sight in the first three to six months notice, without pain or discomfort, a gradual deterioration of sight, which, however, can be permanently corrected by a second discission.

EDITORIAL NOTICE.

The August and September numbers of this Journal have been unavoidably delayed on account of the printers' strike.

ON PINGUECULA AND PTERYGIUM.*

BY ADOLF ALT, M.D.

WHEN in 1875 or 1876 Professor Horner of Zürich announced it as his opinion that the little innocent looking tumor known by the incorrect name of pinguecula, was the origin of the very much more important form of tumor, known as pterygium, this idea was looked upon as wholly visionary and even ridiculous.

Arlt's views concerning the formation of a pterygium were in those days the governing ones.

It so happened that in 1876 I had the good fortune to obtain an eye with pterygium, and Goldzieher had the same good fortune a year or two later. Our examinations led to very similar results and seemed to prove that, as a rule, the formation of pterygium took place in accordance with Arlt's ideas. As you know, he assumed a peripheral corneal ulcer which was covered by an inflamed fold of neighboring conjunctiva. An agglutination of the two tissues was followed by a dragging or growing inward of the conjunctival tissue into the cornea, as the ulcer progressed toward the center of the latter membrane. In my specimens Bowman's layer was detached at the periphery and folded on itself, hook shape, as if the conjunctiva, growing into the cornea beneath it, had dragged its periphery along with it. But the most convincing condition was that under the conjunctival tissue a large cavity was found filled with degenerated and degenerating epithelial cells, which appeared to be incarcerated conjunctival epithelium. From these results of my examination I considered Arlt's views proved, in so far that this was at least one way in which a pterygium might originate, and I must still believe this to be true, if only in exceptional cases.

This was, of course, contradictory to Horner's opinion. But in the light of much further experience I can only wonder that in those days not one of the many excellent clinical observers seems to have known of a direct connection between pinguecula and pterygium, and not one, as far as I remember, brought forward any facts in support of Horner's statement.

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The few pingueculæ which I had had occasion to examine histologically before writing my book on the histology and pathology of the eye, were stained in the inferior manner of those days and gave me the impression that a pinguecula consisted of the very much condensed fibrous tissue of the conjunctiva and a hyperplasia of the conjunctival epithelium of such a degree that I could only compare it to an epithelioma. While it is now an established fact that there are such pingueculæ in which the hyperplasia of the epithelium is very pronounced, they seem to be rather exceptional forms.

Both pinguecula and pterygium have since been carefully studied by a number of investigators. Fuchs' work on these subjects is, perhaps, the best known and most generally adopted, although after him Sgrosso, Schulek, Huebner and others have also made careful investigations with results which vary in some points considerably from Fuchs' views.

In speaking of pinguecula, Fuchs states: "The pinguecula consists of a thickening of the conjunctiva due in the main to a *hyaline degeneration* of the connective tissue elements and deposits of free hyaline. The causes producing such a degeneration are the senile alterations of the tissues combined with external noxious influences. The same noxious influences lead in the corneal tissue to a similar hyaline degeneration, as for instance, in arcus senilis (which seems to be wrong), ribbon-shaped keratitis, and yellow spots in old corneal scars. Another important change at the site of a pinguecula consists of an extraordinary increase in number and volume of the *elastic fibres*."

Sgrosso, agreeing in the main with Fuchs, thought that we must distinguish between an episcleral and a conjunctival pinguecula, and he further assumes two subdivisions of the conjunctival form, namely, an epithelial and a connective tissue pinguecula. He seems to have met with an inordinate number of the epithelial variety.

The more recent and important work on pinguecula is that of Huebner. He found as the almost uniform histological characteristics of pinguecula a degeneration of the tissue elements of the conjunctiva in the whole area of the pinguecula. The participation in this degenerative process by the different tissues varied greatly in different specimens.

He found in the main that the tissue of the conjunctiva proper undergoes a hyaline degeneration. This hyaline tissue seems to become compressed and forms under the epithelium a band of varying thickness without nuclei and blood vessels, almost without structure. The tissue beneath this hyaline band consists of innumerable oblique and transverse sections of elastic fibres. He concludes that the elastic fibres which normally occur in the conjunctiva and subconjunctival tissue, become hypertrophied, grow longer and thicker, even ten to twenty times their normal thickness, but he finds no proof of any new formation of elastic tissue. In the hyaline tissue free hyaline is formed in the form of smaller or larger concretions which give the characteristic hyaline stains; in the elastic tissue he finds other droplets and larger concretions which give the characteristic stains of elastine.

Fuchs gave great importance to the hyaline concretions. Huebner cannot agree with him.

The tissue which according to Huebner takes the least part in this process of pinguecula formation is the epithelium, although it is sometimes thicker than normal. Yet, in two cases he found an enormous increase in thickness of the epithelial layers with formation of cell cylinders and buds growing into the depth and accompanied by the well known epithelial pearls, just as we are wont to see it in cases of true epithelioma.

While Huebner thus in a general way agrees with Fuchs, he points out that this author has laid too much stress on the hyaline degeneration of the conjunctival tissue and too little on the degenerative processes in the elastic tissue. It seems as if Fuchs might with propriety say the reverse of Huebner.

As regards a connection between pinguecula and pterygium, Fuchs does not doubt that a pterygium emanates from a pinguecula. Huebner, on the contrary, denies all connection between the two as totally separate processes. In order to explain the manner in which a pinguecula may grow into the cornea and produce a pterygium, Fuchs assumes a "histolytic influence" exerted on the corneal tissue and a peripheral atrophy of the cornea which would produce some form of chemotaxis. He does not accept the opinion of Arlt, and has never seen a corneal ulcer at the head of a pterygium.

Yet he, as well as Sgrosso, speaks of a subepithelial scar formation at the apex of the pterygium, and by it explains the whitish gray line usually seen in that locality.

According to all descriptions, the tissue of the full grown pterygium is that of the conjunctiva pure and simple, and its folds and nooks are covered with conjunctival epithelium. That is, a pterygium in a somewhat advanced stage can histologically hardly be brought into connection with a pinguecula. This is a well known fact, yet, like Fuchs and others, I have clinically seen in quite a number of cases, how a pinguecula would grow nearer and nearer to the corneoscleral margin and finally overstep it and creep on upon the cornea and form a pterygium; and I am also convinced, as we shall see, by histological examination that this is the usual, though, perhaps, not the only manner in which a pterygium is formed. In spite of the great many pingueculæ which we meet with here in America, it is comparatively rare that we have an opportunity of seeing the intermediate stages, since patients pay no attention to a pinguecula and are alarmed at a pterygium only when it has grown so far that it reduces their field of vision, and often not even then.

I have, therefore, when collecting material for my studies, made it a point to get specimens of the intermediate stages, of beginning, not grown, pterygia in order to learn something more about the connection between pinguecula and pterygium. From my examination of this material I have become more convinced than before that a pinguecula is, as a rule, the origin of a pterygium, although I must assume from my own first case of pterygium and from Goldzieher's that once in a while a pterygium may result from a peripheral corneal ulcer in the way Arlt explained it.

As regards pinguecula pure and simple, the results of my more recent examinations agree with those of the previous investigators, but I find that it would be incorrect to claim special prominence for any one of the different degenerative processes described as of more particular importance by several of them. The larger the number of cases examined, the more the apparent differences dwindle out of sight and a general average can be struck.

Thus I found that in most cases of pinguecula the epi-

thelium is of normal thickness or nearly so. In other cases it is in places or *in toto* atrophied. In others, again, there is a decided hyperplasia of the epithelial cover, while some rare cases, as I have stated before, the epithelial hyperplasia is such that it gives the exact picture of an epithelioma, minus an infiltration zone, and can hardly be distinguished from it. In fact, I believe now that a case of epithelioma in a boy, which I published a number of years ago, may have been just such a pinguecula. (See Figs. 1 and 2).



Fig. 1.

Pinguecula showing epithelium of varying thickness; under it is a light, narrow band of hyaline tissue and numerous hyaline concretions. The bulk of the tissue is made up of elastic fibres.



Fig. 2.

Pinguecula with enormous epithelioma-like hyperplasia of epithelium.

Most investigators mention in particular that the conjunctival epithelium in their cases was especially rich in goblet cells. I have not found that this is a very striking feature in my specimens.

The hyaline degeneration of the conjunctival tissue is always present and this band of hyaline tissue appearing in sections at right angles to the surface may be comparatively thin and look very much like Bowman's membrane, or considerably thicker. In most cases its thickness varies in different parts of the same specimen.

In nearly every specimen, smaller and larger concretions of varying shape are found embodied in it or near it, especially on the side toward the cornea. These are deposits of free hyaline and do not differ in appearance and shape from those found in the corneal tissue in old scars. The variety in shape is evidently due to the pressure exerted upon them by the surrounding tissue during their formation.

Underneath this hyaline tissue lies one which with a low power appears granular, almost like detritus. With a high power it is seen to consist of innumerable fibres cut at right angles or obliquely, hence the granular appearance. By means of the proper staining material—I had the best results with Weigert's elastine stain or orceine, but even eosine will do—the fibres can better be recognized and their character as elastic fibres is affirmed. They are much thicker and longer and wavy than the normal elastic fibres. They further undergo a degenerative process which leads to their breaking up and to the formation of similar concretions as those found in the hyaline part. They appear at first in small particles like dust, which gradually coalesce to form the larger conglomerates. I cannot satisfactorily make out whether this mass of tightly compressed and interwoven elastic fibres is solely the result of a hypertrophy of the normally present elastic fibres, or whether a new formation of elastic tissue takes place. (See Fig. 3).

Thus far we had to deal with purely degenerative changes in the conjunctiva and subconjunctival tissue. The picture is changed when we come to examine a beginning pterygium. Here I nearly always find that the pinguecula is preceded in its onward march toward the cornea by a dense connective



Fig. 3.

Showing the hypertrophied elastic fibres, and a narrow hyaline band with a great deal of free hyaline beneath the epithelium.

tissue which is rich in cells and which gradually merges into the corneal tissue. At the corneo-scleral juncture the epithelium is usually considerably thickened and instead of the epithelial papillæ normally found dipping into the underlying tissue at this place, I find the epithelial layer thrown outward into a fold in the hollow of which very frequently free hyaline is situated. This gives the impression as if the dense connective tissue during its growth toward the cornea dragged the pinguecula after itself in the same direction. This dense connective tissue takes its origin undoubtedly from the pre-existing conjunctival tissue lying between the pinguecula and the corneo-scleral margin, and seems to me to be the important link between the pinguecula and a pterygium. Evidently the presence of the degenerated tissues of the pinguecula acts like a foreign substance and produces a slow inflammatory reaction in the tissue which severs the pinguecula from the corneal margin. (See Figs. 4, 5 and 6).

A further evidence of an inflammatory process, be it ever so slow, I found underneath the corneal epithelium. Bow-

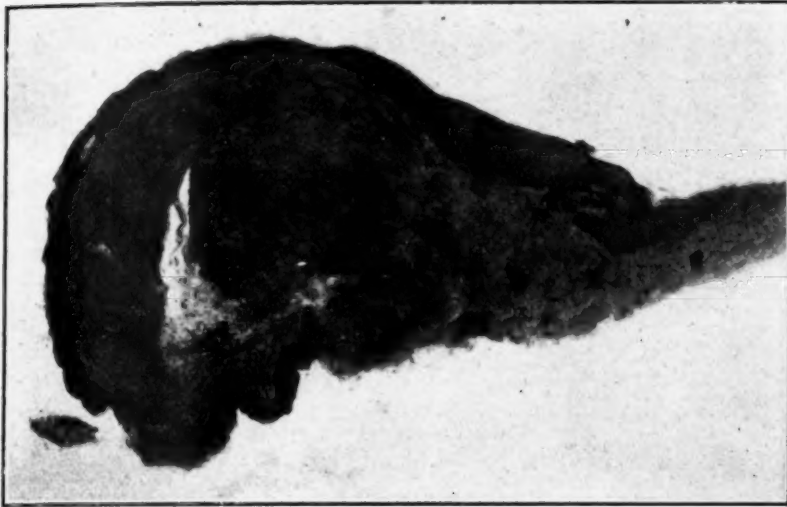


Fig. 4.

Beginning pterygium. To the left, pinguecula; to the right, the newly formed connective tissue under the folded epithelium.

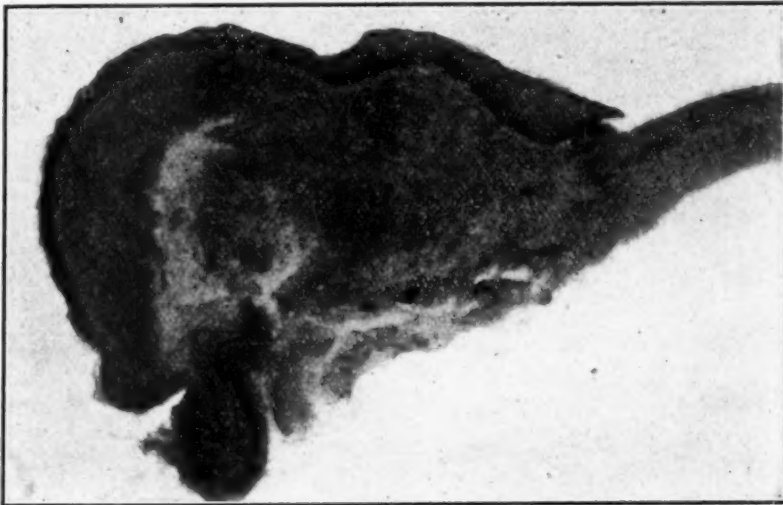


Fig. 5.

The same as Figure 4, from another case.

man's membrane in the norm begins at the very corneo-scleral juncture. When a pterygium is forming, it begins some distance from this point toward the center of the cornea and always some distance further in, than where the

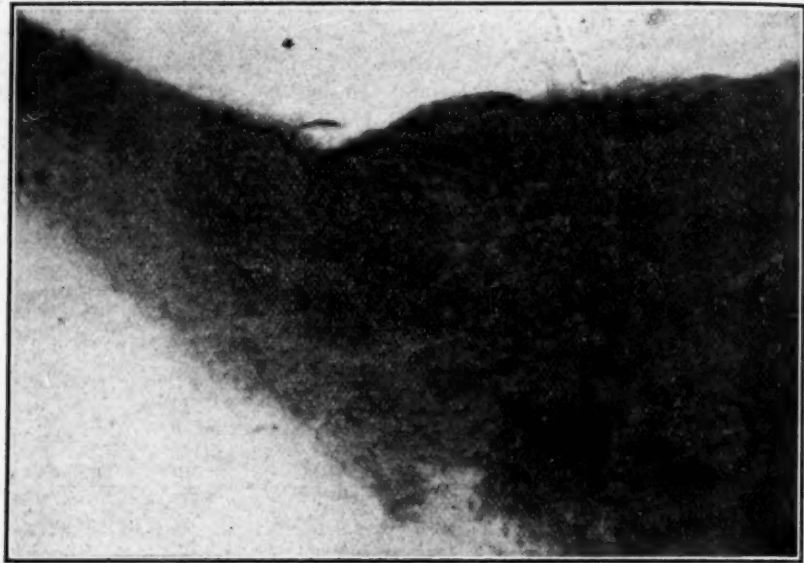


Fig. 6.

The newly formed tissue under a higher power. Concretions of elastine.

apex of the pterygium lies. That is, its peripheral part has disappeared and is disappearing *pari passu* as the pterygium progresses into the cornea. The cause of this melting away of Bowman's membrane is best seen in early stages of pterygium formation. Here I find numerous leukocytes lying at the site of Bowman's membrane and penetrating into the corneal epithelium. Their action evidently has destroyed it. They are found lying in rows and heaps at the former site of Bowman's membrane and in the basal layer of the epithelium they are seen in the shape of the well known "Entzündungsspieße" (inflammatory spears). (See Figs. 7 and 8). These leukocytes probably have emigrated from the few small blood vessels which always grow into the corneal tissue in front of the apex of a pterygium.

Thus it seems evident that at the time when a pinguecula gives rise to the formation of a pterygium, there is no peripheral corneal atrophy in the sense of Fuchs' description and no superficial ulcer in the strict sense of Arlt's opinion, but a very similar process with tissue death which goes on in the anterior layers of the corneal parenchyma, in Bowman's



Fig. 7.

Corneal epithellum from beginning pterygium. Leukocytes in basal layer.

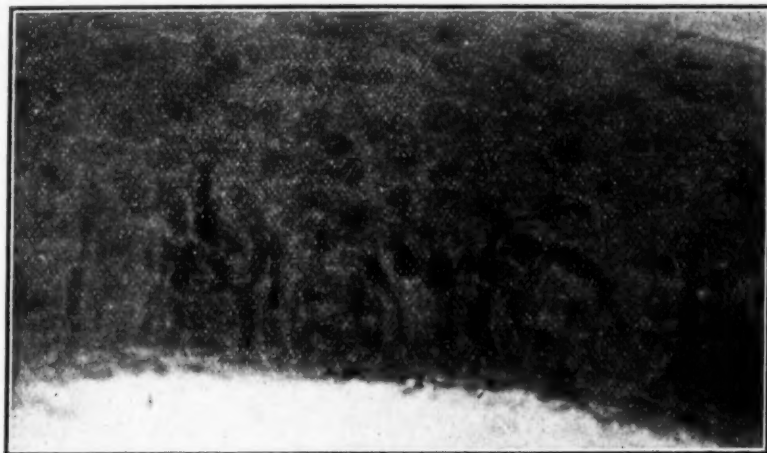


Fig. 8.

A similar condition under a higher power from another specimen.

membrane and the basal layer of the corneal epithelium, which might be termed an internal ulcer and which opens the way for the conjunctival tissue to grow in between parenchyma and epithelium.

As the pterygium grows further into the cornea the characteristic features of the pinguecula, as a rule, are gradually lost while the contraction of the newly formed tissue drags the conjunctiva more and more into the cornea. Sometimes, however, the pterygium may have grown for quite a distance into the cornea and still some of the hyper-

trophied elastic tissue may be found near its apex in some of the sections. (See Figs. 9 and 10).

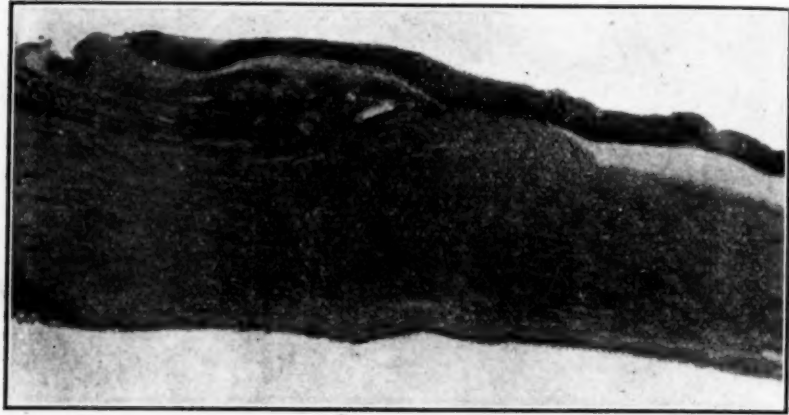


Fig. 9.

Apex of a pterygium with remnants of elastic fibres at the very apex.

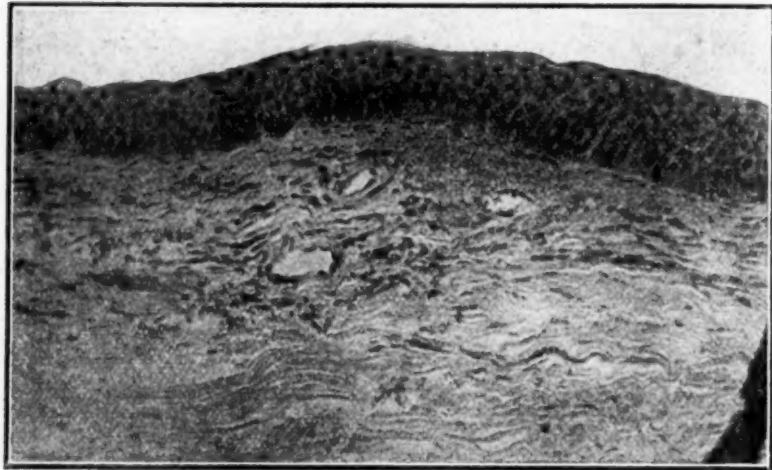


Fig. 10.

Apex of the same under a higher power. The granular tissue is composed of elastic fibres.

I have specimens of another case of beginning pterygium in which the tumor seems to be made up almost solely of elastic fibres. At the corneo-scleral margin where Bowman's membrane should begin in the sections the elastic tissue seems to grow directly into the cornea between epithelium and corneal parenchyma preceded by a few small blood vessels.

I took this eye from the corpse of a negro in the dissecting room and had not seen the man during life, yet the appearance was exactly that of a pterygium internum not far advanced beyond the corneo-scleral margin. (See Figs. 11 and 12)

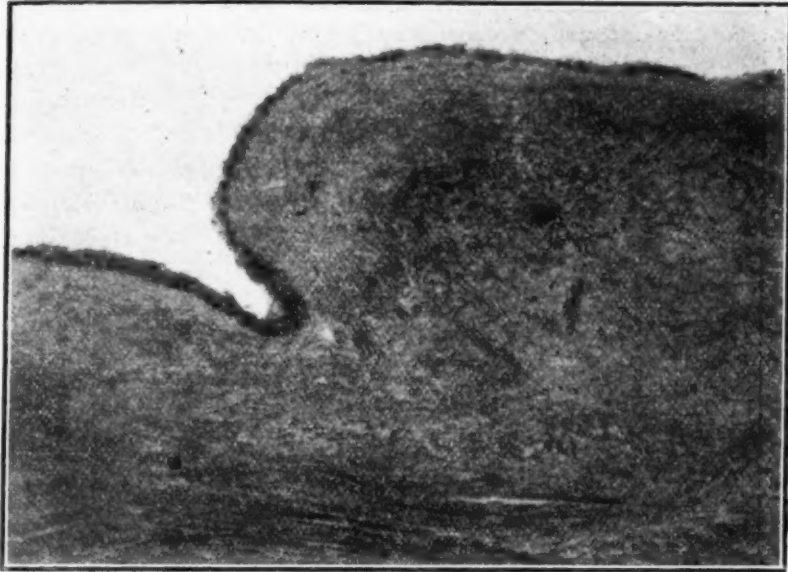


Fig. 11.

Apex of beginning pterygium consisting chiefly of elastic fibres.

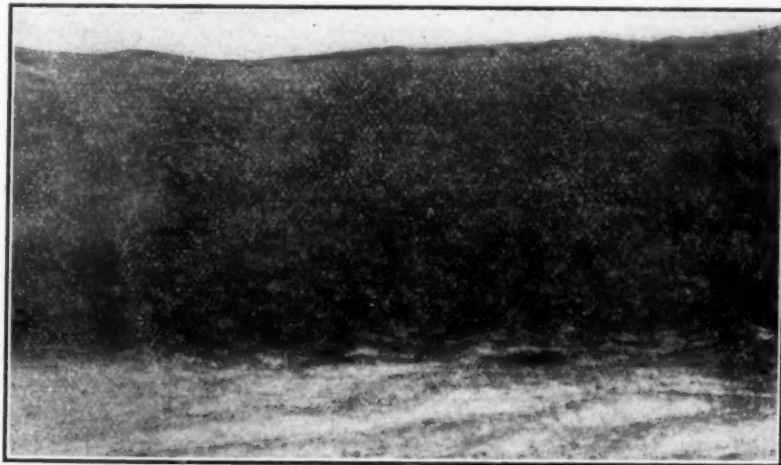


Fig. 12.

The same, further back from the corneoscleral margin.

After all this, it seems to me that the connection between pinguecula and pterygium is no longer as mysterious as it used to be, and we may assume it as certain that in most cases a pinguecula has been the first step to the formation of a pterygium, which does not by any means say that every pinguecula must form a pterygium. Given the necessary conditions, the presence of a pinguecula leads to a slow inflammatory process in the conjunctival tissue which separates it from the corneo-scleral margin, with new formation of tissue. This newly formed tissue, preceded by some small blood vessels, grows into the cornea between epithelium and parenchyma in the place of Bowman's membrane which is destroyed in advance of the oncoming head of the pterygium by an army of leukocytes. The newly formed tissue drags the pinguecula, and the conjunctiva on the other side of it, along in its growth toward the centre of the cornea, and the characteristic tissue of the pinguecula is gradually lost.

The idea that bacteria might figure in the progress of the tumor in the cornea, which I shared at one time with Panas and others, must, I think, be abandoned; at least I have never been able to find any.

Having, perhaps, tired you by this pathological paper, and in order to give you more material for discussion, I just want to add a few words as to the simplest operation for pterygium, the one which I prefer to avulsion, electric cautery destruction, transplantation and all other methods.

Having removed the apex of the pterygium as cleanly as possible from the cornea and excised a rhomboid piece of conjunctiva in the well known old fashion, I make a free cut through the conjunctiva at the limbus upward and downward so as to relax this membrane perfectly. I know that Dr. Savage described these cuts in his operation, but I have made them years before his publication and did not think that I was the only one to whom the value of such relaxing incisions had occurred. After this I cauterize especially the corneal wound vigorously with pure carbolic acid, apply no sutures and close the eye. In several hundred cases of pterygium thus operated upon, I have met with very few relapses.

It seems hardly worth while to say that I much prefer, if

the patient will allow it, to remove a pterygium at its very beginning, or better yet, a pinguecula. The reasons for this are self-evident.

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MEDICAL SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

JOHN TWEEDY, F. R. C. S., President in the Chair.

July 7th, 1905.

TUBERCLE OF THE IRIS.

This paper, by Mr. M. S. MAYOU, had reference to tuberculosis in general, but more particularly to the case of a boy, aged 3 years, who had tubercular dactylitis previous to the appearance of the tubercular mass in the iris and also at the time this actually appeared. The writer considered that all these cases were secondary to tuberculous trouble elsewhere. In this case the cornea had been invaded, the lens capsule had ruptured spontaneously and several masses of exudation had appeared in the retina. Very considerable centralization in the retina, the iris itself, and at the angle of the anterior chamber, had taken place. Lantern slides were also shown illustrative of the above case.

SYMPATHETIC OPHTHALMIA.

Paper by Mr. SIMEON SNELL: This case occurred in a man aged 38, whose left eye had been injured by a sharp piece of metal causing a large wound in the cornea; this wound extended into the ciliary region and resulted in a prolapse of the iris and consequent incarceration of it in the wound. The patient had not been seen until eleven days after the accident, but then the iris had been freed from

the lips of the wound, which rapidly and completely healed. The injury was received on September 8th, 1904, and on October 12th the right—the uninjured eye—was noticed to be red, and five days after there was well-marked iritis, and the case was noted as one of severe sympathetic ophthalmia. A month later the iritis settled down, the iris becoming free; the congestion, redness and pain of the eye began to lessen, and the result after some months was a completely healed eye with vision $\frac{6}{5}$ and Jg. I, with both the exciting and the sympathizing eye. Since this no further trouble had been complained of. In the discussion which followed Mr. Snell stated that he had not the least doubt but that this was a genuine case of sympathetic ophthalmia, which fortunately had ended much better than most of such cases.

SYMPATHETIC OPHTHALMITIS ARISING AFTER ENUCLEATION.

Three cases were recorded by Mr. SNELL in which sympathetic ophthalmitis had come on after excision of the injured eyeball at various times after receipt of the injury; and reference was made to a case reported by himself in the *Ophthalmological Society's Transactions* for 1882, Vol. II, p. 19, in which an eye, injured by a piece of steel which had remained within the globe, was enucleated eight weeks after the accident, and subsequently sympathetic ophthalmitis developed in the remaining eye, 32 days after the enucleation had been performed, and 106 days after the receipt of the injury. In this particular case, eserine had been instilled in the sympathizing eye to allay the irritation, but had apparently acted in a reverse manner, causing a sudden outburst of inflammation in an eye suffering only from subacute sympathetic irritation. In these four cases referred to, one had been a mild attack and had recovered, three had been severe, and two of the eyes had become totally blind.

GLIOMA IN MORE THAN ONE MEMBER OF THE SAME FAMILY.

Paper by Mr. SIMEON SNELL: This was the case of a male child, aged $2\frac{1}{4}$ years, in which glioma was found in each eye. The only other child of these parents was a girl, born in 1897, who was similarly affected with glioma in each eye; in her case death had resulted.

Only some three other observers had placed similar cases

on record, and the writer referred to a paper which he had read before the Society last year (*Ophthalmological Society Transactions*, Vol. XXIV, 1904, p. 230). In this case a child aged 4½ months was found to have glioma in the right eye, which was thereupon removed, and the microscopical examination confirmed the diagnosis. It was then found out that one of the patient's brothers had suffered from glioma of both eyes which—the parents not consenting to an operation—had been perforce allowed to run its course, with the result that each growth fungated into an enormous mass protruding from each orbit, extending down the face and reaching almost to the mouth, so near in fact that the child could only drink out of a cup by throwing its head far back. The child was born on October 5th, 1899, the glioma was first noticed in the right eye a year later, and a few months after this glioma was found in the left eye, still a year later both growths were of such a size as to preclude any operation, and on February 18th, 1903, the child died.

Another case of glioma, first in one eye and then in the other, reported at the same time, had done well since removal of both eyes, the patient being at the present time in good health.

MICROPHTHALMOS.

Mr. R. CRUISE: The patient, the subject of this paper, a young woman aged 24 years, had had a swelling in the left orbit from birth, with a small degenerated microphthalmic eye pushed into the upper and outer quadrant of the orbit. During the last two years this swelling had much increased in size with corresponding displacement of the eyeball. Clinically it was difficult to arrive at a differential diagnosis between a cyst in communication with a microphthalmic eye, and meningocele. The swelling, which occupied the greater part of the orbit, was fleshy looking and fluctuating to the touch. Pathologically a free communication was found to exist between the interior of the eyeball and the interior of the cyst in the posterior part of the globe, and the ciliary body being well developed a free passage of fluid secreted by it took place; this accounted for the increase in size of the swelling during the last two years. The cyst contained spaces in which fluid was present, and for the greater part was filled with a mass of rounded cells. Several lantern slides of the sections were shown.—*Ophthalmic Review*.

SEVENTY-THIRD MEETING OF THE BRITISH MEDICAL ASSOCIATION.

SECTION OF OPHTHALMOLOGY.

Held at Leicester, July 24th to 28th.

The President, Dr. G. A. Berry, opened the proceedings of the Section of Ophthalmology by reviewing the progress in this science during the last few years, and then called upon Dr. A. Bronner (Bradford) for his paper. The latter read the notes of a case of slight myopia in which distressing local and general symptoms were relieved by the use of glasses which were much too strong, and referred to the many cases of wonderful cures reported in the lay press from the use of glasses; many of these cures were undoubtedly due to suggestion only. Mr. E. E. Henderson followed with a paper on the action of eserine and atropine on the pupils and the influence on the filtration of the intraocular fluids. Cats' eyes had usually been used in the investigation, and ether was the anaesthetic employed. He described the apparatus used and the method of experimentation. Mr. N. Bishop Harman gave the results of electric treatment of trachoma at the Middlesex Hospital. He had treated 13 cases, some with X-rays, others with high-frequency current, and others with radium. He explained that in the X-ray cases he used X-rays and nothing else, not the burning rays that are emitted from some tubes. These rays produced no good effect whatever, and after extended trial the old treatment of bluestone, etc., had to be used; 4 of these cases were thus treated; with high-frequency treatment none of the cases showed any improvement. Two cases were then tried with radium, and did no better. Mr. Devereux Marshall gave his experience, and it was entirely unfavorable to the use of both X-rays and radium. Mr. Cril Walker was under the impression that the treatment gave much relief if not cure. Colonel Drake-Brockman thought that nitrate of silver was, years ago, by far the best treatment. Now the other compounds of argyrol and cuprol were as good, and were far less painful. Mr. Harman, in reply, said that no amelioration of the symptoms followed the use of the electrical treatment. He now carefully used silver, copper, and expression. Mr. Bishop Har-

man read a paper on false hay fever. He described the case of a lady who had apparently severe hay fever, and the attack came on each year. He found her astigmatic, and after correction she entirely lost her symptoms. He explained this as being due to an exaggeration in the normal fifth nerve reflex that so frequently started attacks of sneezing. Mr. Devereux Marshall thought that if Mr. Harman's theory were correct it was remarkable that patients should suffer only during the hay season, considering that as much light was present during other months of the year, and also at sea. The president doubted the reflex theory altogether. Mr. Harman thought that after the dark winter the light was felt more than later on, when people were used to it. Professor Hess showed drawings regarding the migration of pigment in cephalopod eyes according to the amount of light allowed to fall upon the eye. Dr. Karl Grossman followed with a lantern demonstration of natural colored photographs of cases of lepra ophthalmica as seen in Iceland, and then read a second paper on congenital absence of the dilatation of the pupil. After the use of atropine nothing but the smallest dilatation of the pupil took place, though there was no synechia. There was nystagmus, and a rudimentary iris in the right eye only. When eserine was used, the pupil became slit-like, and no lens was visible. He also showed a hot-air cautery for the treatment of conical cornea; he had used it in five cases with good result. The application might be repeated several times if necessary. Finally, Dr. Cecil Shaw (Belfast) read notes of a case of amblyopia, apparently toxic; it followed influenza, the patient being a man, aged 20, whose sight was much affected during the attack, and was now slowly improving. Mr. Bishop Harman related a somewhat similar case.

Thursday, July 27th.

Work in this section was resumed on Thursday, July 27th, by the introduction of the discussion on intraocular tuberculosis by Mr. W. H. H. Jessop, who first gave a history of the recognition of the disease, and then carefully analyzed twenty cases collected from various sources. In illustration he showed a beautiful series of ophthalmoscopic drawings of a case which he had watched for a considerable time; recovery had so far progressed that the patient's vision had returned

to $\frac{6}{12}$. Vitreous opacities, he said, were hardly ever seen with tuberculous lesions of the eye. With gummata there were always dust-like opacities. The question of treatment by tuberculin, as practiced by Von Hippel, was carefully described, and the speaker asked for the experience of others who might have tried it. He expressed the view that the only certain method of diagnosing the disease was by inoculation of material from the affected eye into an animal. Professor Hess said he had used tuberculin in twenty-six cases. As to local reaction, he found it only in two cases, and this was the only way in which they should diagnose with certainty the presence of tubercle in the eye. Mr. Hern (Darlington) said that he thought that tuberculin T.R. was useful for diagnosis, but useless for treatment. Mr. Tatham Thompson mentioned a case in which he had performed excision, and the patient died three weeks later from meningeal tuberculosis. Professor Hess said that he should not fear to excise a tuberculous eye, but he thought it seldom necessary. He was under the impression that it was hardly possible that tubercle could be primary in this situation. Dr. Cecil Shaw described a case in which he had excised an eye for tubercle. Symptoms of meningitis came on, but the patient recovered perfect health subsequently. Mr. J. H. Parsons said that many people considered that tubercle in the eye was often primary. Mr. Beaumont (Bath) related a case. Sir Victor Horsely discussed the question of the differential diagnosis from the appearance of the fundus in tuberculous disease and in gliomatous tumors. He asked the members of the Section if this were possible; if it were, they had advanced considerably in their diagnosis. Mr. Bishop Harman said that in cases of pigmentary choroiditis the vast majority were due to syphilis and not to tubercle. Mr. Jessop replied, and laid stress on the fact that if the sclerotic were affected dissemination was very likely to occur; if the sclerotic were not affected, dissemination was not at all likely. Dr. J. Hern read some observations on the effect of the presence of adenoids in the naso-pharynx in some eye affections. The diseases which usually went with this condition were phlyctenular conjunctivitis, eczematous conjunctivitis, photophobia, and weak ulcers. In all these cases the naso-pharynx should be care-

fully examined. Mr. Benson (Dublin) read a paper on evolution in blepharoplasty, and traced the origin of modern operations from the old scalping procedure which always produced xerophthalmia. He described the most modern operation of transplanting mucous membrane from the lip of the patient, which was equally applicable to the upper and lower lids; this operation has been done hundreds of times at St. Mark's Hospital, Dublin, and the results were excellent. Prof. Hess found that the transplantation of mucous membrane was by far the best operation, and he had done it for years. Dr. Henry agreed that it was a satisfactory method. Mr. Tatham Thompson was not so impressed with its utility. The President asked as to its ultimate results, and Mr. Benson said that it was absolutely permanent; as it was a fortnight after the operation so it remained permanently, but the flap should extend the whole length of the eyelid; partial operations were useless. Dr. Cecil Shaw said that transplanted skin flaps were very satisfactory. Dr. Benson in reply, said that skin was infinitely inferior to mucous membrane, as all skin contained hairs, and the epithelium was quite unfitted to touch the eye; it remained skin forever. The President, Dr. G. A. Berry, gave a description of a new test for visual acuteness which was particularly useful for illiterates and children. Dr. Beaumont thought the test appeared to be most useful.

Friday, July 28th.

The discussion on capsular complications after cataract extraction was opened on Friday by Mr. Treacher Collins, who showed photographs of the microscopical appearance of eyes in which the capsule had become entangled in the wound; these showed the very imperfect union which occurred under these circumstances; the capsule acted as a foreign body in the wound. He next discussed the effect of adhesion of the capsule to the wound without its being actually entangled. This did not give rise to delayed union, but its ill effect was due to the drawing forwards of the capsule and iris, and this was likely to cause closure of the angle of the anterior chamber, provided it was sufficiently drawn forwards. As regards the prevention of capsular adhesions and entanglement, he pointed out that, although in the case of a simple extraction

without iridectomy the chances of capsule complication were diminished, yet it could not be altogether prevented, and he showed photographs of adhesion of the anterior hyaloid membrane as well as of capsule which had taken place after simple extraction. As to the relief of tension after capsule complications, most of the operations did but little good. An iridectomy done opposite the coloboma might, if done early enough, be sufficient to open up the angle; and in some cases it was possible to divide the capsule at the place of entanglement with Lang's knives. As regards the prevention of secondary opacities, he advocated the tearing away of the anterior capsule, and gave statistics of his results. The President said that he thought highly of the use of the repositor in every cataract extraction, but if glaucoma came on he always did another iridectomy opposite the original one. Dr. Bronner found that when using capsule forceps, dislocations of the lens and loss of vitreous were more frequent than when the cystotome was used. Mr. Tatham Thompson said that he had never satisfied himself as to the relative merits of capsule forceps and the cystotome. He was much impressed with the benefit of washing out the anterior chamber with M. Keown's apparatus. Mr. Cyril Walker and Dr. Hearn made remarks, and the latter said that he was in the habit of cutting out a circular piece of capsule with the cystotome. Colonel Drake-Brockman said he first of all dilated the pupil fully before the extraction; after the incision he made a triangular opening in the capsule, base up, with a Bowman's needle. He found that he seldom got capsule complication after this. Mr. Parsons spoke on the anatomical aspect, and confirmed the points brought out by Mr. Collins. Dr. Henry thought the reaction was much less when a peripheral opening in the capsule was made than when a large opening was attempted. Mr. Devereux Marshall thought that the posterior capsule had more to do with the development of secondary opacity than the anterior capsule. Mr. Collier Green expressed his views. Mr. Collins, in reply, said he did not think a conjunctival flap made any difference to the entanglement or otherwise of the capsule. He was not in favor of irrigating the anterior chamber, on account of the extra risk of introducing foreign material, such as

epithelium, into the chamber, which he had known to give rise to cysts in the anterior chamber. He did not think that the use of capsule forceps produced excessive reaction, and he was sure he did fewer needlings than when he used the cystotome.—*British Medical Journal*.

THE AMERICAN ACADEMY OF OPHTHALMOLOGY
AND OTO-LARYNGOLOGY.

At the meeting of this Academy held at Buffalo, September 14th to 16th, the following officers were elected for the ensuing year:

President—Dr. Casey A. Wood, Chicago, Ill.

First Vice-President—Dr. J. A. Stuckey, Lexington, Ky.

Second Vice-President—Alvin A. Hubbell, Buffalo, N. Y.

Third Vice-President—Dr. Emile Meyer, New York, N.Y.

Secretary—Dr. George F. Suker, Chicago, Ill.

Treasurer—Dr. Otto J. Stein, Chicago, Ill.

Council—Dr. Casey A. Wood, Dr. W. L. Ballenger, Dr. H. W. Loeb, Dr. Adolf Alt, Dr. John E. Weeks.

The place of meeting is to be determined later.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M. D.

ST. LOUIS, MO.

OBSTRUCTION IN THE RETINAL ARTERIES.

Allen Greenwood (*Jour. Amer. Med. Asso.*, March 11) says the three most frequent causes of obstructions in the retinal arteries are arterial disease, embolism, and spasm. Thrombosis in a healthy retinal artery is a very rare occurrence, while in the pathological conditions mentioned it is rarely absent. Arterio-sclerosis, occurring as part of a general degeneration of the arteries, is perhaps responsible for more cases of obstruction of the retinal arteries than any other cause, although its importance is not always recognized and the actual condition is frequently overlooked. The ophthalmoscope shows a slight increase in the reflex from the

arteries, with irregularities in their size, and where an artery crosses a vein the latter is often compressed, dilating it at the distal end, and more of the vein is hidden than the apparent width of the artery, showing that the latter has thicker walls than usual. The discs are often slightly congested and a feathery outline is observed, with a feathery exudate beside the arteries. If the central artery in the

SLIGHT ERRORS OF REFRACTION AND THEIR INFLUENCE ON
THE NERVOUS SYSTEM.

C. E. Prouger (*Lancet*, June 10) emphasizes the fact that slight errors of refraction may exert pronounced influence on the nervous system. He also invariably found errors of refraction in neurasthenic cases, which if not corrected "led to insomnia, extreme depression, great irritability, difficulty of concentration of thought, lack of self confidence, apprehension, weariness, exhaustion, and a general want of stability of the nervous system." Prouger insists that all errors of refraction should be corrected in every case of neurasthenia.

THE IMPORTANCE OF TESTING THE OCULAR MUSCLE-BALANCE
FOR NEAR AS WELL AS FOR DISTANT VISION.

Samuel Theobald (*Trans. Am. Oph. Soc.* 1904) emphasizes the importance of making a careful test of the muscle balance for near, as well as for distant vision, in all cases of asthenopia, as there often exists a marked difference between the behavior of the muscles in distant and in near vision. When muscle imbalance for near vision exists, glasses adapted for near work, that is to say, lenses, which in addition to correcting the refractive error present, take into account also the muscular fault, should be ordered. Theobald, occasionally, in dealing with the condition of discordance between the far and the near muscle balance, prescribes bifocal lenses, even for young patients. Recently he has observed several cases of hyperphoria, which was present in near vision only, and which proved to be an important factor in the causation of asthenopic symptoms. He has also seen several instances in which there was hyperphoria in one direction in distant vision and in the opposite direction in near vision. These findings indicate the value of making tests of the muscle-balance for near vision.